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Health-promoting factors and good health among Canadians in mid- to late life

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Abstract

According to results from the Canadian Community Health Survey—Healthy Aging, 76% of Canadians in mid-life (45 to 64) and 56% of seniors reported good health in 2009. This is based on a definition of health composed of: positive self-perceived general and mental health, functional ability, and independence in activities of daily living. Good health existed even in the presence of chronic conditions such as high blood pressure, arthritis and back problems, all of which were common among people aged 45 or older. Eight modifiable factors were associated with good health: smoking status, body mass index, physical activity, diet, sleep, oral health, stress, and social participation. Eighty-four percent of the younger age group and 91% of seniors reported positive tendencies on four or more of these factors. The more factors on which positive tendencies were reported, the greater the likelihood of having good health.

Keywords

aging, chronic conditions, cross-sectional study, determinants of health, health status, health survey, IADL

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Like many nations, Canada is about to face an unprecedented era of population aging. From 8% fifty years ago, it is projected that Canadian seniors will comprise 23% to 25% of the population in about 25 years' time.[1] A major contributor to this demographic shift is the baby-boom cohort, defined as those born from 1946 to 1965. The senior ranks will swell rapidly starting in 2011 when the first baby-boomers turn 65. Based on data from the 2009 Canadian Community Health Survey (CCHS)—Healthy Aging, this article addresses issues faced by the senior population, comparing them with people in the 45 to 64 age range.

The far-reaching social and economic consequences of the increase of the senior population have provoked debate about the availability and sustainability of health care resources.[2-5] Central to this concern is the growing imbalance between the number of younger contributors to the social support system and the number of older beneficiaries of this support.[1] Currently, Canada has, on average, five people of working age (15 to 64) to support each senior; by 2030, it is projected (based on a medium-growth scenario) that there will be three workers for every person aged 65 or older.[1]

Advancing age brings a greater likelihood of developing chronic conditions, many of which result in the need for informal support, medical care, medications, and institutionalization.[6,7] In 2002, *Building on Values: The Future of Health Care in Canada - Final Report* focussed on the prevention of illness and disability, citing the importance of health practices related to smoking, diet and physical activity.[4] Preventing, delaying, or at the very least, reducing the severity of chronic conditions would not only enhance individuals' quality of life as they age, but might also ease demand on health care resources.[5,8]

The data

Estimates for this study were based primarily on the 2009 Canadian Community Health Survey (CCHS)—Healthy Aging. This cross-sectional survey collected information about the factors, influences and processes that contribute to healthy aging. The survey collected data from people aged 45 or older living in private dwellings in the ten provinces. The sampling frame excluded full-time members of the Canadian Forces and residents of the three territories, Indian reserves, Crown lands, some remote regions and institutions. The survey was conducted from December 1, 2008 through November 30, 2009, using Computer-Assisted Personal Interviewing. Response rates were 80.8% (household level), 92.1% (person level), and 74.4% (combined) for a final sample of 30,865 respondents. Men comprised 43% of the sample; 47% of respondents were aged 45 to 64.

The 2000/2001 CCHS was used for historical comparisons of the percentage of Canadians in good health. This cycle covered residents of the provinces and territories. Data collection took place from September 1, 2000 to November 3, 2001. The combined response rate was 84.7%, for a final sample size of 131,535. The responding sample for those aged 45 or older in the ten provinces was 60,892. Detailed documentation on the CCHS can be found on Statistics Canada's website. Unless otherwise stated, the following information pertains to the 2009 CCHS—Healthy Aging.

The primary outcome variable was self-reported *good health*. To be considered in good health, respondents had to meet four criteria: good functional health, independence in activities of daily living, positive self-perceived general health, and positive self-perceived mental health. These components of good health were self-reported and were not verified by any other source.

Functional health, defined as the absence of a disability, was based on questions about vision, hearing, speech, mobility, dexterity, cognitive abilities and chronic pain. A disability is total or partial reduction in the ability to perform an activity in a way or within limits considered normal. People without disabilities or with a fully corrected disability (wearing glasses, for example) had good functional health.

To be *independent in activities of daily living*, respondents had to report that they had no impairment on seven activities of daily living (ADL) and seven instrumental activities of daily living (IADL). The ADL activities were: feeding themselves, dressing themselves, taking care of their appearance, walking around, getting in or out of bed, bathing, and getting to the bathroom on time. The IADL activities were: using the telephone, travelling, shopping, cooking, doing housework, taking medicine, and handling money. Independence was assessed with a different and less extensive list of activities in 2000/2001: preparing meals, shopping for groceries or other necessities, everyday housework, heavy household chores (washing walls, yard work), personal care (washing, dressing or eating), and moving about inside the house. The wording of the questions also differed between 2000/2001 and 2009. In 2000/2001, respondents were asked if they needed help because of a health condition; in 2009, respondents were simply asked if they needed help. The 2009 question was less restrictive than in 2000/2001, and the list of activities was more extensive, so it is to be expected that respondents would be more likely to register a dependency in 2009, resulting in a larger percentage of people with dependencies.

Self-perceived health was based on the question, "In general, would you say your health is ...." Those who responded good, very good or excellent (versus fair or poor) were defined as having "positive" self-perceived health.

Self-perceived mental health was based on the question, "In general, would you say your mental health is ...." Those who responded good, very good or excellent (versus fair or poor) were defined as having "positive" self-perceived mental health. Because self-perceived mental health was not available on the 2000/2001 CCHS, mental health was assessed by considering the probability of having had a major depressive episode in the previous year. Those with a probability of 0.05 or less met the criterion for good mental health. The use of different measures of mental health in 2000/2001 and 2009 had no impact on the overall increase in good health (data not shown).

To be considered in overall good health, respondents had to be free of problems related to each of these four criteria—that is, they did not have a disability or dependency and reported that their mental and general health were good, very good or excellent. If no answer was provided for one of these measures, but the other three responses suggested the respondents were in good health, they were considered to be so. Respondents missing answers for two or more measures were excluded.

Socio-demographic variables included in the study were: sex, age, education and living arrangements. Respondents were grouped by *age*: seniors (age 65 or older) and adults in mid-life or the "younger" age group (45- to 64-year-olds). Age was included as a continuous variable in the logistic regression analysis. The *highest level of education* in the household was categorized as: less than secondary graduation, secondary graduation (including some postsecondary), or postsecondary graduation. For *living arrangements*, respondents were classified as living alone or not.

The presence of *chronic conditions* was established by asking respondents if a health professional had diagnosed them as having conditions that had lasted, or were expected to last, at least six months. Respondents were read a list of conditions. Only conditions associated with aging were included in this study: Alzheimer's disease or other dementia, arthritis, back problems, bowel disorders (such as Crohn's Disease, ulcerative colitis, Irritable Bowel Syndrome and bowel incontinence), chronic obstructive pulmonary disease (including chronic bronchitis and emphysema), diabetes, eye problems (cataracts or glaucoma), heart disease (including angina and ever having a heart attack), high blood pressure (including people who reported that they did not have high blood pressure but were on blood pressure medication), urinary incontinence, osteoporosis, and suffering from the effects of a stroke. The *number of chronic conditions* was categorized into five groups: none, 1, 2, 3, and 4 or more.

Eight factors with *health-promoting* potential were examined. *Smoking status* was divided into two categories: current daily smokers including former smokers who had quit daily smoking in the past 15 years, and people who had never smoked daily or who had quit daily smoking for 15 or more years. Based on *body mass index (BMI)*, respondents were classified as obese (BMI 30 kg/m^2 or more) or not (BMI less than 30 kg/m^2). Quality of *sleep* was determined by asking: "How often do you have trouble going to sleep or staying asleep?" Those who responded some/a little/none of the time were considered to sleep well, as opposed to those who answered most/all of the time. Fruit and vegetable consumption was used as an indicator of a good *diet*; respondents were divided into those who ate five or more servings a day and those who did not. People who responded good/very good/excellent to the question, "In general, would you say the health of your mouth is...?", were classified as having good *oral health*. *Physical activity* was measured by frequency of walking. Frequent walkers were those who responded "often (5 to 7 days)" to the question, "Over the past 7 days, how often did you take a walk outside your home or yard for any reason? For example, for pleasure or exercise, walking to work, walking the dog, etc." Frequent *social participation* was defined as participating in community-related activities at least weekly. Respondents were asked about activities that included other people: family or friendship activities outside the household, religious, sports, educational and recreation activities; volunteer work; activities with service organizations; and so on. Finally, respondents were asked, "Thinking about the amount of stress in your life, would you say that most days are ...." Those who answered not at all/not very stressful were considered to have low daily *stress*, as opposed to those who answered a bit/quite a bit/extremely stressful.

This analysis was based on the population aged 45 or older. The data were weighted to reflect the age and sex distribution of the Canadian population in this age range. Weighted frequencies and cross-tabulations were used to estimate the percentages of people who: had chronic conditions, were in good health, and reported health-promoting factors. Logistic regression was used to model associations between health-promoting factors and good health, controlling for sex, age, household education, living arrangements, and number of chronic conditions. To account for survey design effects, standard errors and coefficients of variation were estimated with the bootstrap technique.[9,10] A significance level of $p < 0.05$ was used.

The current study has a number of limitations. The 2009 CCHS—Healthy Aging did not include residents of long-term health care institutions (less than 1% of 45- to 64-year-olds and 7% of seniors).[11] Given that older age and ill health are associated with moving to an institution, the sample becomes less representative of the entire senior population at successively older ages. The temporal order between health-promoting factors and good health cannot be established because the survey is cross-sectional. As well, chronic conditions were self-reported and were not verified by an external source. Cancer was not included as one of the chronic conditions because it was not possible to distinguish people without cancer from those in remission.

In cases where the selected respondent was, for reasons of physical or mental health, incapable of completing an interview, another household member supplied information about the selected respondent. Such proxy reporters can often provide accurate answers to most of survey questions, but information about more sensitive or personal matters is likely beyond the scope of their knowledge. As a result, some questions from the proxy interview were not answered. Efforts were made to keep proxy interviews to a minimum—2.2% (689) of the interviews were by proxy. 1.3% (192) of 45- to 64-year-olds and 3.0% (497) of seniors.

This study provides up-to-date estimates of the prevalence of chronic conditions, good health, and factors related to good health for the household population aged 45 or older. Health is defined by a composite measure that includes self-perceived general and mental health, functional abilities and independence in activities of daily living. Each component of health is self-reported; respondents' health status was not verified by any other source. Measures based on these criteria have been used in earlier studies[8,12] and are consistent with the World Health Organization concept of health as being more than simply the absence of disease or infirmity.[13] While chronic conditions are related to perceptions of health, functional abilities and independence, they are not part of the definition of health in this study. The presence of chronic conditions does not automatically exclude a person from reporting good health.

Eight factors that have the potential to affect health are examined in this analysis: smoking, body mass index (BMI), physical activity, diet, sleep, oral health, stress, and social participation. While not an exhaustive list, these are some of the major factors for which data are available on the CCHS—Healthy Aging. Because of the cross-sectional nature of the data, temporal order cannot be inferred from associations between these factors and health. Longitudinal research has shown that many of these factors are predictors of maintaining good health and recovering from illness.[12] However, it must be acknowledged that the relationships may also move in the reverse direction with health status affecting the selected factors.

The CCHS—Healthy Aging covers the *household* population; estimates from this survey do not represent the less than 1% of the population aged 45 to 64 and the 7% of seniors who reside in long-term health care institutions.[11]

Chronic conditions

The demographic shift over the last century took place in tandem with an *epidemiological transition* from mortality at younger ages as a result of infectious diseases, parasites and perinatal conditions to an era when degenerative diseases evolved as major health concerns.[14] Degenerative diseases develop over a lifetime of behaviours, lifestyle factors and environmental influences, and so are more evident at older ages.

Results of the 2009 CCHS—Healthy Aging show that seniors were more likely than people aged 45 to 64 to experience a number of specific chronic conditions (Table 1). More than half of seniors, compared with about one-quarter of 45- to 64-year-olds, reported hypertension or the use of high blood pressure medication. Hypertension is a risk factor for other vascular disorders and a major cause of death.[15] Arthritis does not cause death, but it can have a major impact on quality of life, because it is associated with disability, dependence, falls, fractures, and medication use.[16-19] The prevalence of arthritis among seniors (43%) was more than double the prevalence among people aged 45 to 64 (20%). Like arthritis, back problems can affect quality of life;[20] the prevalence of back problems was significantly higher among the older age group: 29% versus 25%. Although seniors were more likely than 45- to 64-year-olds to experience Alzheimer's disease or other dementia and the effects of a stroke, these conditions were not common in either age group. People with dementia and stroke have higher odds of living in long-term health care facilities,[6] so these conditions would not be expected to be highly prevalent in the household population.

Incontinence, too, is a predictor of moving to a health care institution,[6] and like Alzheimer's disease or other dementia and the effects of stroke, has a severe impact on health-related quality of life.[21] Even so, more than one in ten seniors in the household population reported urinary incontinence.

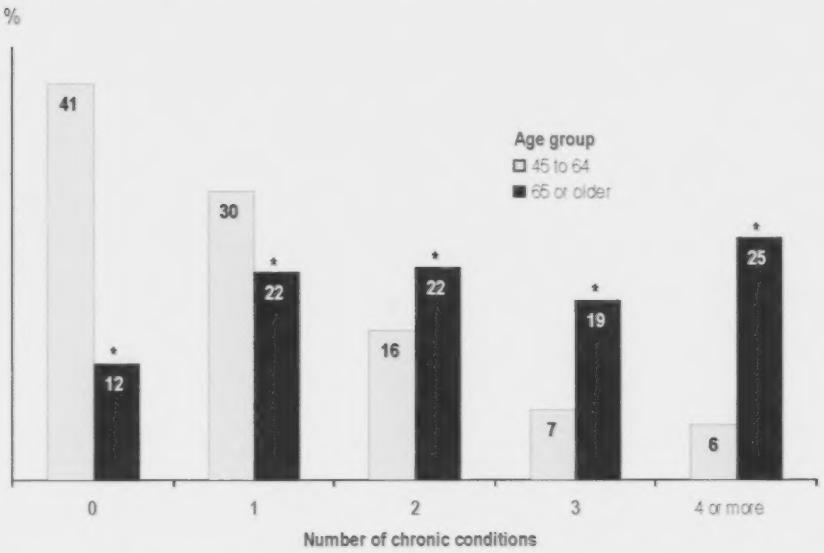
Not surprisingly, as people age, they are more likely to have multiple chronic conditions.[22] For example, 25% of seniors reported at least four chronic conditions, compared with 6% of 45- to 64-year olds (Figure 1). Coping with chronic conditions is challenging for the affected individuals,[20,23] and for family members, friends and caregivers if the conditions result in greater dependency, hospitalizations and further complications.[24-26]

Table 1
Prevalence of chronic conditions, by age group, household population aged 45 or older, Canada, 2009

	45 to 64			65 or older		
		95% confidence interval			95% confidence interval	
Chronic condition	%	from	to	%	from	to
High blood pressure	24.0	22.8	25.4	52.9*	51.7	54.1
Arthritis	20.3	19.2	21.6	43.4*	42.3	44.6
Back problems	25.0	23.8	26.3	28.6*	27.5	29.8
Eye problems (cataracts or glaucoma)	4.6	4.1	5.1	27.9*	26.8	28.9
Heart disease	6.9	6.3	7.6	22.6*	21.7	23.5
Osteoporosis	6.1	5.6	6.7	18.1*	17.2	19.0
Diabetes	8.6	7.8	9.5	17.2*	16.4	18.1
Urinary incontinence	3.3	2.8	3.8	11.7*	11.0	12.5
Chronic obstructive pulmonary disease	4.6	4.0	5.3	8.8*	8.1	9.6
Bowel disorder	5.1	4.6	5.8	6.4*	5.8	7.1
Stroke	1.1	0.9	1.4	4.2*	3.7	4.6
Alzheimer's disease	0.1†	0.1	0.2	1.6*	1.4	1.9

* significantly different from estimate for 45 to 64 age group ($p < 0.05$)
† use with caution (coefficient of variation 16.6% to 33.3%)
Source: 2009 Canadian Community Health Survey — Healthy Aging

Figure 1
Percentage distribution of household population aged 45 to 64 and 65 or older, by number of diagnosed chronic conditions, Canada, 2009



* significantly different from estimate for 45 to 64 age group ($p < 0.05$)
Source: 2009 Canadian Community Health Survey — Healthy Aging

Good health

A sizeable percentage of people aged 45 or older were in good health, based on their self-perceived general and mental health, and measures of functional ability and independence (Figure 2). Understandably, the prevalence of good health declines with age, but even up to age 85, at least half the population were in good health in 2009. Among seniors, men were more likely than women to have good health, a difference that was not evident in the younger age group (Table 2). Higher levels of education were positively associated with good health, as was some form of shared living arrangement. As expected, the more chronic conditions people had, the less likely they were to have good health.

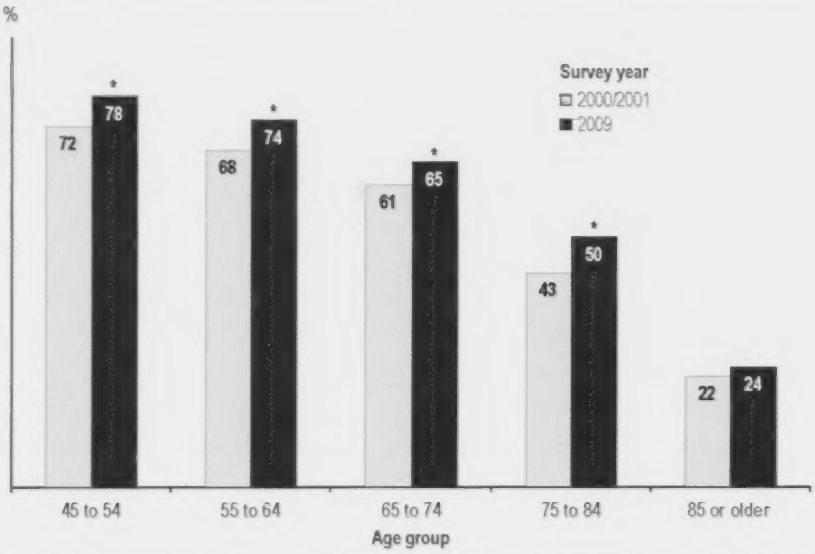
From 2000/2001 to 2009, the prevalence of good health rose significantly in almost every age group (Figure 2). The four factors comprising good health—self-perceived general health, self-perceived mental health, functional abilities and independence—each contributed to the overall increase (data not shown).

Only the oldest seniors (85 or older) did not have a significant increase in good health over the nine years. The percentages reporting good self-perceived general health and functional health increased significantly, but the percentage who were independent in activities of daily living (ADL/IADL) decreased slightly (data not shown). This decrease may reflect changes in the ADL/IADL questions between the 2000/2001 and 2009 CCHS (see *The data*). The decrease in the prevalence of independence in ADL/IADL likely offset increases in the other factors, resulting in no net change over the period in the percentage of seniors aged 85 or older in good health.

Health-promoting factors

The development of chronic conditions is not inevitable. While genetic predisposition plays a role, factors within individuals' control can prevent the development of chronic conditions or limit their severity. Eight potentially

Figure 2
Prevalence of good health, by age group, household population aged 45 or older, Canada, 2000/2001 and 2009



* significantly different from estimate for 2000/2001 ($p < 0.05$)
Note: Depression used instead of self-perceived mental health for 2000/2001.
Source: 2009 Canadian Community Health Survey — Healthy Aging; 2000/2001 Canadian Community Health Survey

Table 2
Prevalence of good health, by age group and other selected characteristics, household population aged 45 or older, Canada, 2009

	45 to 64			65 or older		
		95% confidence interval			95% confidence interval	
Characteristics	%	from	to	%	from	to
Total	**76.2**	**74.9**	**77.5**	**55.5**	**54.3**	**56.7**
Socio-demographic factors						
Sex						
Men	76.5	74.5	78.4	59.0*	57.2	60.7
Women†	75.9	74.1	77.7	52.6	51.1	54.1
Education						
Less than secondary graduation	59.0*	54.1	63.8	46.5*	44.3	48.8
Secondary graduation†	71.3	68.2	74.3	54.7	52.0	57.3
Postsecondary graduation	79.1*	77.7	80.5	60.9*	59.2	62.6
Lives alone						
Yes	70.6*	67.8	73.2	50.1*	48.4	51.7
No†	77.1	75.7	78.5	57.8	56.2	59.3
Number of chronic conditions						
None	90.7	89.2	92.0	81.4	78.8	83.7
1	77.9*	75.4	80.1	74.0*	71.7	76.2
2	65.9*	62.5	69.2	62.1*	59.6	64.6
3	46.6*	41.9	51.5	48.9*	46.3	51.6
4 or more	31.8*	27.4	36.6	26.6*	24.5	28.8
Health-promoting factors						
Smoking status						
Current daily smoker/Quit in past 15 years†	69.7	67.3	72.0	50.3	47.7	53.0
Never smoked daily/Quit for 15 or more years	79.7*	78.2	81.1	56.7*	55.4	58.0
Body mass index (BMI)						
Obese†	69.5	66.4	72.4	46.4	43.6	49.3
Not obese	79.1*	77.7	80.4	59.5*	58.3	60.8
Sleeps well						
Yes	81.2*	79.9	82.4	61.2*	59.9	62.5
No†	59.8	56.5	63.0	40.5	37.9	43.2
Fruit/Vegetable consumption						
Five or more times per day	83.2*	81.6	84.7	62.9*	61.1	64.7
Less than five times per day†	72.7	70.9	74.4	52.8	51.4	54.3
Good oral health						
Yes	79.3*	78.0	80.6	58.3*	57.1	59.5
No†	54.2	50.2	58.1	34.2	31.2	37.2
Frequent walker						
Yes	79.2*	77.4	80.8	63.4*	61.7	65.0
No†	73.8	72.0	75.5	49.0	47.3	50.7
Frequent social participation						
Yes	79.2*	77.8	80.5	59.8*	58.5	61.1
No†	68.7	65.8	71.5	43.2	40.8	45.6
Low daily stress						
Yes	83.5*	81.7	85.1	60.7*	59.2	62.1
No†	72.5	70.7	74.3	48.8	46.9	50.7

† reference category; for number of chronic conditions, reference category is previous number
* significantly different from estimate for reference category ($p < 0.05$)
Source: 2009 Canadian Community Health Survey — Healthy Aging.

modifiable factors are examined in this study: smoking, BMI, physical activity, diet, sleep, oral health, stress, and social participation.

The vast majority of adults—84% of people aged 45 to 64 and and 91% of seniors—reported four or more positive tendencies with regard to these factors (Table 3). In fact, more than half (53%) of seniors reported at least six, compared with 37% of 45- to 64-year-olds.

Fully 82% of seniors had either never smoked daily or had quit for at least 15 years, compared with 65% of the younger cohort. As well, seniors were less likely to be obese and more likely to eat the recommended number of servings of fruit/vegetables. These differences may reflect a "healthy survivor effect," whereby people who are non-smokers, eat well, and watch their weight have a greater likelihood of longevity. Alternatively, some seniors with health-promoting tendencies may have had health problems and responded with positive changes. Other differences may be associated with retirement or other age-related changes in how they use their time. For example, 57% of seniors reported low daily stress, compared with 34% of adults in mid-life. Seniors were slightly more likely to report frequent social participation: 75% versus 72% of the younger age group.

For the remaining factors, there were no significant differences by age. More than three-quarters of each age group reported sleeping well, and almost 90% had good oral health. Fewer than half were frequent walkers, the measure of physical activity.

Associations with good health

As expected, the number of diagnosed chronic conditions was negatively associated with good health (Table 2). At the same time, the modifiable factors examined in this study were each positively associated with good health. People who refrained from smoking, walked frequently and were not obese were more likely to be in good health than were those who did not have these characteristics. Positive associations were also evident between good health and frequent social participation, low daily stress, sleeping well, good oral health, and eating fruit/vegetables five or more times a day.

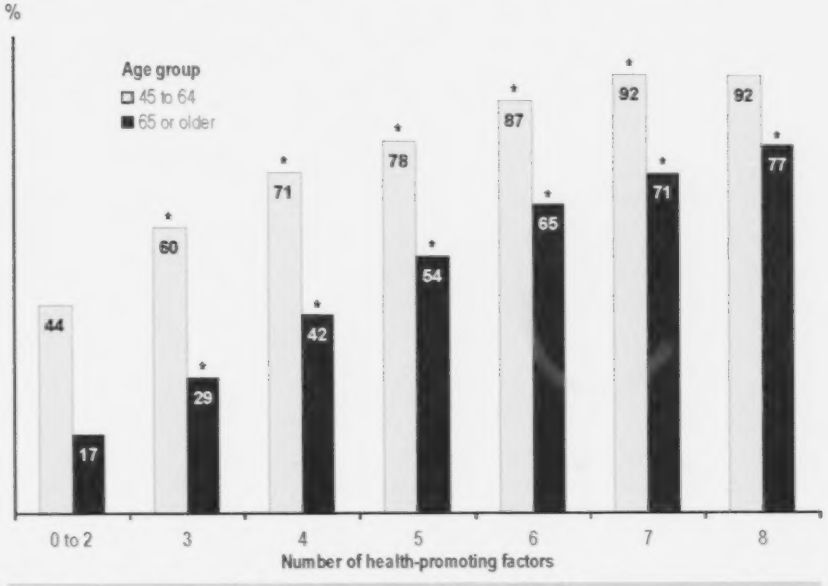
Health-promoting tendencies might be expected to cluster within individuals. However, when the eight factors were simultaneously controlled for in multivariate models along with socio-demographic factors, each was independently associated with good health for both age groups (Appendix Table A). For the most part, these

Table 3
Prevalence of health-promoting factors by age group, household population aged 45 or older, Canada, 2009

	45 to 64			65 or older		
		95% confidence interval			95% confidence interval	
Health-promoting factors	%	from	to	%	from	to
Never smoked daily/Quit for 15 or more years	65.4	64.0	66.8	81.8*	80.9	82.7
Not obese (body mass index less than 30 kg/m²)	76.8	75.3	78.1	81.1*	80.1	82.0
Sleeps well	78.2	77.0	79.4	78.6	77.7	79.5
Fruit/Vegetable consumption five or more times per day	36.5	34.9	38.1	39.0*	37.7	40.3
Good oral health	87.7	86.7	88.7	88.4	87.6	89.1
Frequent walker	44.7	43.0	46.5	45.3	44.0	46.6
Frequent social participation	71.8	70.2	73.3	75.0*	73.9	76.1
Low daily stress	33.6	32.0	35.2	56.7*	55.5	57.9
Number of health-promoting factors						
0 to 2	5.5	4.9	6.2	2.4*	2.1	2.8
3	10.5	9.5	11.6	6.7*	6.1	7.3
4	20.4	19.0	21.8	14.6*	13.7	15.5
5	26.6	25.2	28.0	23.7*	22.7	24.7
6	21.9	20.6	23.3	27.1*	26.0	28.2
7	11.9	10.8	13.0	19.5*	18.5	20.5
8	3.2	2.7	3.9	6.0*	5.4	6.6

* significantly different from estimate for 45 to 64 age group ($p < 0.05$)
Source: 2009 Canadian Community Health Survey — Healthy Aging

Figure 3
Prevalence of good health, by number of health-promoting factors and age group, household population aged 45 or older, Canada, 2009



* significantly different from estimate for previous category in same age group ($p < 0.05$)
Source: 2009 Canadian Community Health Survey — Healthy Aging; 2000/2001 Canadian Community Health Survey

associations persisted even when the number of chronic conditions was taken into account (Appendix Table B).

The results of the analysis suggest that the benefits of health-promoting tendencies are cumulative (Figure 3). Generally, with every additional health-promoting factor, the likelihood of good health increased. More than three-quarters (77%) of seniors who reported positive tendencies on all eight factors were in good health; among people aged 45 to 64, the figure was 92%. Although advancing age was associated with poorer health, a senior with positive tendencies on five or more factors was more likely to be in good health than was a 45- to 64-year-old with positive tendencies on two or fewer factors.

Despite longitudinal evidence that many of the health-promoting factors have an impact on health,[27,28] the cross-sectional nature of the CCHS—Healthy Aging does not allow the temporal order of events to be established. It is possible and probable that relationships between the health-promoting factors and health also work in the opposite direction. Ill health, for example, may interfere with the ability to exercise regularly, sleep well, and socialize. The experience of coping with chronic conditions may prove stressful. And illness may leave people without the resources to manage their weight, prepare healthful meals or optimize their oral health. Nonetheless, the importance of these factors in promoting good health remains.

Conclusion

Canada's population is aging, and as the baby-boomers reach 65 during the next two decades, this demographic change will accelerate. The 2009 Canadian Community Health Survey—Healthy Aging indicates that even in the presence of some chronic conditions, 76% of people aged 45 to 64 and 56% of seniors living in private households (versus long-term health care institutions) had good health, based on their perceptions of general and mental health, functional abilities, and independence in activities of daily living. As well, Canadians in mid- to late life were slightly more likely

to be in good health in 2009 than they had been almost a decade earlier.

A number of factors over which individuals have some control were associated with good health. Not smoking, weight control, regular exercise, fruit/vegetable consumption, sleeping well, oral health, stress reduction, and participation in activities with family and friends had a cumulative association with good health. A large majority of respondents reported four or more of these health-promoting tendencies. ■

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Appendix

Table A
Adjusted odds ratios relating socio-demographic and health-promoting factors to good health, by age group, household population aged 45 or older, Canada, 2009

	45 to 64			65 or older		
	Adjusted odds ratio	95% confidence interval		Adjusted odds ratio	95% confidence interval	
Characteristics		from	to		from	to
Socio-demographic factors						
Sex						
Men	1.1	0.9	1.3	1.1*	1.0	1.3
Women†	1.0	...	...	1.0	...	...
Age (continuous)	0.96*	0.95	0.97	0.91*	0.90	0.92
Education						
Less than secondary graduation	0.7*	0.5	0.9	0.9	0.7	1.0
Secondary graduation†	1.0	...	...	1.0	...	...
Postsecondary graduation	1.2*	1.0	1.5	1.1	0.9	1.3
Lives alone						
Yes	0.8*	0.7	1.0	1.0	0.9	1.1
No†	1.0	...	...	1.0	...	...
Health-promoting factors						
Smoking status						
Current daily smoker/Quit in past 15 years†	1.0	...	...	1.0	...	...
Never smoked daily/Quit for 15 or more years	1.3*	1.1	1.5	1.5*	1.3	1.7
Body mass index (BMI)						
Obese†	1.0	...	...	1.0	...	...
Not obese	1.6*	1.3	1.9	2.0*	1.7	2.3
Sleeps well						
Yes	2.5*	2.1	2.9	2.0*	1.7	2.3
No†	1.0	...	...	1.0	...	...
Fruit/Vegetable consumption						
Five or more times per day	1.5*	1.3	1.7	1.3*	1.2	1.4
Less than five times per day†	1.0	...	...	1.0	...	...
Good oral health						
Yes	2.9*	2.4	3.5	2.1*	1.7	2.4
No†	1.0	...	...	1.0	...	...
Frequent walker						
Yes	1.2*	1.0	1.4	1.5*	1.3	1.6
No†	1.0	...	...	1.0	...	...
Frequent social participation						
Yes	1.4*	1.2	1.7	1.5*	1.4	1.7
No†	1.0	...	...	1.0	...	...
Low daily stress						
Yes	1.8*	1.5	2.1	1.7*	1.5	1.9
No†	1.0	...	...	1.0	...	...

† reference category
* significantly different from estimate for reference category ($p < 0.05$)
... not applicable
Source: 2009 Canadian Community Health Survey — Healthy Aging

Table B
Adjusted odds ratios relating socio-demographic factors, health-promoting factors and number of chronic conditions to good health, by age group, household population aged 45 or older, Canada, 2009

	45 to 64			65 or older		
		95% confidence interval			95% confidence interval	
Characteristics	Adjusted odds ratio	from	to	Adjusted odds ratio	from	to
Socio-demographic factors						
Sex						
Men	1.0	0.8	1.2	1.0	0.9	1.1
Women†	1.0	...	...	1.0	...	...
Age (continuous)	1.00	0.98	1.01	0.92*	0.92	0.93
Education						
Less than secondary graduation	0.7*	0.5	1.0	0.9	0.7	1.1
Secondary graduation†	1.0	...	...	1.0	...	...
Postsecondary graduation	1.2	1.0	1.4	1.1	0.9	1.3
Lives alone						
Yes	0.8	0.7	1.0	1.0	0.9	1.1
No†	1.0	...	...	1.0	...	...
Health-promoting factors						
Smoking status						
Current daily smoker/Quit in past 15 years†	1.0	...	...	1.0	...	...
Never smoked daily/Quit for 15 or more years	1.2	1.0	1.4	1.4*	1.2	1.6
Body mass index (BMI)						
Obese†	1.0	...	...	1.0	...	...
Not obese	1.1	0.9	1.3	1.6*	1.4	1.9
Sleeps well						
Yes	1.9*	1.6	2.2	1.7*	1.5	2.0
No†	1.0	...	...	1.0	...	...
Fruit/Vegetable consumption						
Five or more times per day	1.4*	1.2	1.7	1.3*	1.2	1.5
Less than five times per day†	1.0	...	...	1.0	...	...
Good oral health						
Yes	2.6*	2.1	3.2	1.8*	1.6	2.2
No†	1.0	...	...	1.0	...	...
Frequent walker						
Yes	1.2*	1.0	1.4	1.4*	1.2	1.6
No†	1.0	...	...	1.0	...	...
Frequent social participation						
Yes	1.4*	1.2	1.7	1.5*	1.3	1.7
No†	1.0	...	...	1.0	...	...
Low daily stress						
Yes	1.6*	1.4	1.9	1.6*	1.4	1.7
No†	1.0	...	...	1.0	...	...
Number of chronic conditions						
None†	1.0	...	...	1.0	...	...
1	0.4*	0.3	0.5	0.7*	0.6	0.9
2	0.2*	0.2	0.3	0.5*	0.4	0.6
3	0.1*	0.1	0.2	0.3*	0.2	0.4
4 or more	0.1*	0.1	0.1	0.1*	0.1	0.2

† reference category
* significantly different from estimate for reference category ($p < 0.05$)
... not applicable
Source: 2009 Canadian Community Health Survey — Healthy Aging.